A history of war: The role of inter-group conflict in sex differences in aggression

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Abstract: Human aggression has two important dimensions: *within*-group aggression and *between*-group aggression. Archer offers an

excellent treatment of the former only. A full explanation of sex differences in aggression will fail without accounting for our history of inter-group aggression, which has deep evolutionary roots and specific psychological adaptations. The causes and consequences of inter-group aggression are dramatically different for males and females.

Human aggression takes two very different forms: (1) *intra-group* aggression (between individuals); and (2) *inter-group* aggression (between groups of individuals, such as coalitions, gangs, warriors, armies). Archer argues that observed sex differences in aggression are best explained by sexual selection theory, but this is based on an exclusive focus on intra-group aggression, ignoring the potential explanatory (or confounding) role of inter-group aggression.

We suggest that the inter-group dimension is vital to understanding sex differences in aggression: If inter-group processes explain *some* of the variance in sex differences in aggression, then Archer may have *overestimated* the role of sexual selection in accounting for the observed sex differences, and may also have *underestimated* sex differences in aggression overall (since they may be even higher in inter-group contexts).

Inter-group aggression has arguably been a major force in human evolution. There is evidence that warfare was frequent and severe throughout human history (Gat 2006; Guilaine & Zammit 2004; Keeley 1996; LeBlanc & Register 2003) and has deep roots in human evolution (Alexander 1987; Thayer 2004; Wrangham & Peterson 1996). Warfare has been a significant cause of male deaths (13–15% in the archeological and ethnographic record; Bowles 2006), suggesting a strong selection pressure on adaptations for inter-group aggression.

Studies of warfare differ in many respects but are in agreement on one thing: it is almost *exclusively* a male phenomenon (Potts & Hayden 2008; Wrangham & Peterson 1996). Although women commonly aid in war *efforts* of various kinds, they generally do not participate as warriors. Legends of Amazons and female warriors are so rare (or unsubstantiated) as to serve as exceptions that prove the rule. The introduction of women into *combat* units in modern militaries has also been problematic (Browne 2007). We should, therefore, expect significant sex differences in adaptations to inter-group aggression.

Inter-group aggression introduces at least two complexities to Archer's analysis. First, as noted above, some variance in sex differences in aggression is likely to derive from inter-group processes, not sexual selection. Second, inter-group aggression can often be a cause of *reduced* aggression between males of the *same* group – uniting to fight a common enemy. Indeed, extraordinary cooperation (even self-sacrifice) can emerge in the context of inter-group aggression (McNeill 1995; Rielly 2000). Sex-differentiated aggression in inter-group contexts is as much about inter-male *cooperation* as it is about inter-male aggression.

Empirical evidence supports two key predictions of this "male warrior hypothesis" (van Vugt et al. 2007). First, in situations of *inter*-group threat, men should display more aggression than women. This is a robust finding in both experimental and real-world studies (Johnson et al. 2006; McDermott & Cowden 2001; Wrangham & Wilson 2004). Second, in situations of *inter*-group threat, men should increase their cooperation with the in-group in order to more effectively defend and aggress against the out-group. This is supported by experiments in which cooperation in collective action games increases in the presence of rival groups, but only among men (van Vugt et al. 2007).

An inter-group perspective raises the question of *interactions* between sexual selection and inter-group aggression: what is the impact of sexual selection on aggression between members of different groups? Indeed, inter-group aggression may actually be *rooted* in sexual selection. For example, performance in inter-group warfare may bring status or rewards that increase individual reproductive success (Chagnon 1988). Or, since a primary function of wars in pre-industrial societies is the capture of women (Keeley 1996), warfare may represent competition for reproductive access fought between coalitions rather than between individuals. Finally, inter-group aggression may even be a method of displacing sexual competition from the in-group to the out-group, serving to minimize within-group conflict (and its associated costs).

An inter-group perspective also raises the question of the role of women in aggression. If women have been beneficiaries and victims of inter-group aggression, we would expect selection pressures on response strategies. For example, there is some evidence that women find military men more sexually attractive, but only if they are observed in battle (Leunissen & van Vugt, unpublished). Women also show an aversion to out-group males at peak fertility in their menstrual cycle (Navarrete et al. 2009). Women might even support inter-group aggression if they (or their offspring and kin) will benefit from the consequences. Keeley reports that among the Apache, "when the meat supply of a band began to run low, an older woman would complain publicly and suggest that a raid be mounted to obtain a fresh supply" (Keeley 1996, p. 135).

An inter-group perspective is also important for Archer's analysis of *intersexual* (male on female) aggression. Archer focuses primarily on aggression among *partners*. However, differences in male and female aggression is likely to be highly dependent on group membership. As noted above, a common objective of pre-industrial warfare is the capture of women, and the occurrence of rape in wartime is widely documented even among modern societies (Naimark 1995; Potts & Hayden 2008). Therefore, male aggression against women is likely to be significantly underestimated if we look only at data on partners – men and women who typically chose to be together in the first place, or at least come from the same in-group.

An inter-group perspective does at least support Archer's rejection of social role theory. Briefly, differences in inter-group behavior between boys and girls also appear at a young age and follow a fairly stable developmental trajectory across contexts (Ellis et al. 2008), suggesting an evolutionary explanation. For example, boys more often play team games involving larger groups and have more transient friendships, whereas girls have more exclusive friendships. Boys are also angrier about rule-breaking behavior in such games.

To summarize, inter-group aggression might seem to have little bearing on Archer's core claims – perhaps just representing a different research question. However, we suggest that the omission of an inter-group dimension is significant, because: (1) it underestimates *overall* sex differences in aggression; and (2) *observed* sex differences in aggression may derive from some third factor *other* than sexual selection – in particular inter-group psychology. Thus, even if the evidence that Archer examines is correct, we cannot tell whether it derives from an evolutionary history of sexual selection or from an evolutionary history of inter-group aggression (or some combination thereof). Sex differences in aggression between groups remains an important research area for the future with implications for understanding, predicting, and intervening in human aggression within both domestic and international contexts.